

104.5 Spectrometry, Single Element Standard Solutions

These SRMs are intended as standard solutions for use in calibrating instruments used in atomic spectrometry, including atomic absorption spectrometry, inductively coupled plasma optical spectrometry, and inductively coupled plasma mass spectrometry. They can also be used in conjunction with any other analytical technique or procedure where aqueous standard solutions are required. Each SRM is a single element solution of 50 mL with a nominal concentration of 10 mg/g, except where indicated. Each unit is provided in either a single high density polyethylene bottle or in 5 x 10 mL borosilicate glass ampoules. NOTE: The certified values for SRM standard solution lots produced after March 1997 are stated in mass units, mg/g, rather than mg/mL. For the convenience of the user, each certificate provides instructions for preparing SRM dilutions by volume as well as by mass.

Commercial Producers of Elemental Standard Solutions: Instructions and a spreadsheet have been designed as an aid for establishing traceability of a batch of an elemental solution to the corresponding elemental spectrometric solution from the NIST SRM 3100 Series. Spreadsheet with ICP-OES example data is also included. When all required input fields are filled, the spreadsheet will calculate the traceable mass fraction and uncertainty of the batch elemental solution standard. The uncertainty provided by the spreadsheet assumes that the tested lot is stable. Any uncertainty due to changes over time to the lot tested, need to be quantified by the producer of the lot, and incorporated into the total uncertainty of the lot.

Instructions: <http://www.cstl.nist.gov/nist839/PittCon/Version%201-1%20Traceability%20Tool%20Instructions.pdf>

Spreadsheet:

<http://www.cstl.nist.gov/nist839/PittCon/Traceability%20Tool%20Version%201-1.xls>

Sample data:

[raceability%20Tool%20Version%201-1.xls](#)

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PLEASE NOTE: The tables are presented to facilitate comparisons among a family of materials to help customers select the best SRM for their needs. For specific values and uncertainties, the certificate is the only official source.

SRM	Element	Nominal Acid Concentration
- 3101a	Aluminum	HNO ₃ 10%
- 3102a	Antimony	HNO ₃ 10% + HF 2%
- 3103a	Arsenic	HNO ₃ 10%
- 3104a	Barium	HNO ₃ 1%
-		

-	3105a	Beryllium	HNO ₃ 10%
-			
	3106	Bismuth	HNO ₃ 10%
	3107	Boron (5 mg/g)	H ₂ O
-	3108	Cadmium	HNO ₃ 10%
-			
-	3109a	Calcium	HNO ₃ 10%
-			
-	3110	Cerium	HNO ₃ 10%
-			
-			
-	3111a	Cesium	HNO ₃ 1%
-			
-	3112a	Chromium	HNO ₃ 10%
-			
-	3113	Cobalt	HNO ₃ 10%
-			
-	3114	Copper	HNO ₃ 10%
-			
-	3115a	Dysprosium	HNO ₃ 10%
-			
-			
-	3116a	Erbium	HNO ₃ 10%
-			
-	3117a	Europium	HNO ₃ 10%
-			
-	3118a	Gadolinium	HNO ₃ 10%
-			
-	3119a	Gallium	HNO ₃ 10%
-			
-	3120a	Germanium	HNO ₃ 10% + HF 2%
-			
-			
-	3121	Gold	HCl 10%
-			
-	3122	Hafnium	HNO ₃ 10% + HF 2%
-			
-	3123a	Holmium	HNO ₃ 16%
-			
-	3124a	Indium	HNO ₃ 10%
-			
-			
-	3126a	Iron	HNO ₃ 10%
-			
-	3127a	Lanthanum	HNO ₃ 10%
-			
-	3128	Lead	HNO ₃ 10%
-			

-	3129a	Lithium	HNO ₃ 1%
-	3130a	Lutetium	HNO ₃ 10%
-			
-	3131a	Magnesium	HNO ₃ 10%
-	3132	Manganese	HNO ₃ 10%
-	3133	Mercury	HNO ₃ 10%
-	3134	Molybdenum	HCl 10%
-	3135a	Neodymium	HNO ₃ 10%
-			
-	3136	Nickel	HNO ₃ 10%
-	3137	Niobium	HNO ₃ 10% + HF 2%
-	3138	Palladium	HCl 10%
-	3139a	Phosphorus	HNO ₃ 0.8%
-	3140	Platinum	HCl 10%
-			
-	3141a	Potassium	HNO ₃ 10%
-	3142a	Praseodymium	HNO ₃ 10%
-	3143	Rhenium	HNO ₃ 10%
-	3144	Rhodium (1 mg/g)	HCl 10%
-	3145a	Rubidium	HNO ₃ 1%
-			
-	3147a	Samarium	HNO ₃ 10%
-	3148a	Scandium	HNO ₃ 10%
-	3149	Selenium	HNO ₃ 10%
-	3150	Silicon	H ₂ O
-	3151	Silver	HNO ₃ 10%
-	3152a	Sodium	HNO ₃ 1%
-	3153a	Strontium	HNO ₃ 10%
-			

-	3154	Sulfur	H_2SO_4 0.1%
-	3155	Tantalum	HNO_3 10% + HF 2%
-			
-	3156	Tellurium	HCl 10%
-	3157a	Terbium	HNO_3 16%
-	3158	Thallium	HNO_3 10%
-	3159	Thorium	HNO_3 10%
-	3160a	Thulium	HNO_3 10%
-			
-	3161a	Tin	HNO_3 5% + HF 2%
-	3162a	Titanium	HNO_3 10% + HF 2%
-	3163	Tungsten	HNO_3 7% + HF 4%
-	3164	Uranium	HNO_3 10%
-	3165	Vanadium (5 mg/g)	HNO_3 10%
-			
-	3166a	Ytterbium	HNO_3 16%
-	3167a	Yttrium	HNO_3 10%
-	3168a	Zinc	HNO_3 10%
-	3169	Zirconium	HNO_3 10% + HF 2%
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